PASTORIZA
ELECTRONICS, INC.

DAC
D/A/D SERIES

DIGITAL TO ANALOG SUBSYSTEM COMPONETS

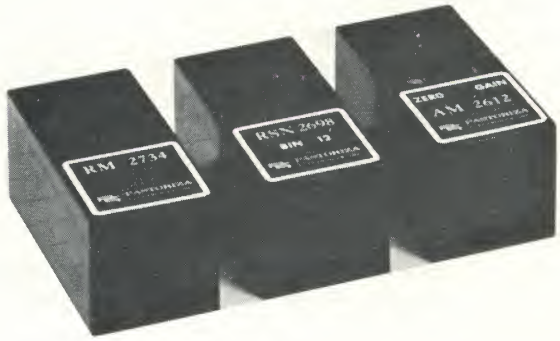
GENERAL DESCRIPTION

D/A/D Series is a group of compatible integrated circuit modules for Digital-to-Analog and Analog-to-Digital Conversion systems. Each module is 3/4" x 3/4" x 1½" and may be plugged or soldered into a printed circuit board.

This bulletin describes three basic D/A/D modules. A Jam Transfer Register RM 2734, a Reference Supply, Switches and Resistor Weighing Network RSN 2698, and the Amplifier Module AM 2612.

Engineering design with D/A/D modules has many advantages. One can design exactly to specification on his own standard card and yet have the advantage of a pre-designed, pretested and guaranteed component.

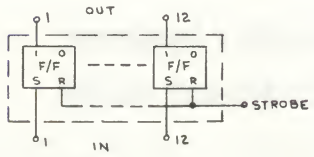
D/A/D units employ monolithic amplifiers and TTL integrated circuit logic. They may be ordered to the specification of the customer in terms of number of bits or resolution, output voltage ranges, speed, and other parameters.



Model RM-2734 is a jam transfer storage register for up to 12-bits. Upon a strobe command it will accept and store numbers. These numbers will be provided on a buffered low impedance output from TTL logic until the register is cleared or strobed again.

Input	Binary "0" <	.8 volts
	Binary "1" >	2 volts
	Strobe	0 v. transfers 2 v. isolates
Output	Binary "0" <	.5 volts
	Binary "1" >	3 volts
Power	+5 VDC @	50 ma.

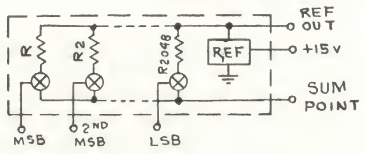
Model RM-2734 8,10,12 = 8,10,12 Bits.



Model RSN-2698 contains switching, resistor network, and a reference source. It can be switched by micro-logic input levels and provides output binary weighted currents to a summing point. BCD weighing currents are also available. This unit is always used in conjunction with an operational amplifier.

Input	Binary "0" <	.5 volts
	Binary "1" >	2 volts
	Resolution	Up to 12 Bits Binary or BCD
Output	Approximately	4 ma. full scale to .8 volts.
	Reference	9 v. @ 2 ma.
	TC	.002%/°C
	Drift	±½ bit 0°C to 50°C
Power	+15 VDC @	10 ma.

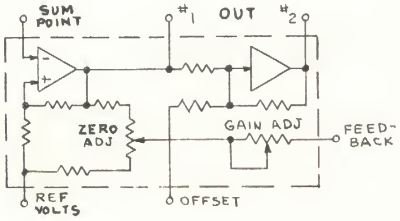
Model RSN-2698-8,10,12 = 8,10,12 bits.
Model DIC-2760-8,10,12
High speed version of Model RSN-2698



Model AM-2612 is a combination of two operational amplifiers with feedback networks for converting currents from RSN-2698 to output voltages. The use of operational amplifiers provides a variety of output ranges at low impedance.

Input	Approximately 4 ma. for full scale out at .8 v. offset
Output	0 to −10 volts, 0 to +10 volts
Range	±5 v. ±10v. all at 10 ma.
Settling Time	20 usec.
Gain & Offset	Adjustment provided
Power	±15 VDC @ 20 ma.

Model AM-2612-1 Unipolar
AM-2612-2 Bipolar



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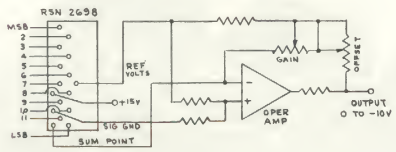
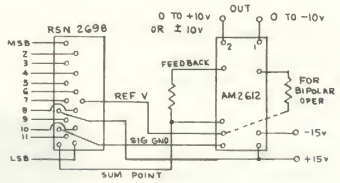
DIGITAL ANALOG CONVERTER

Applications

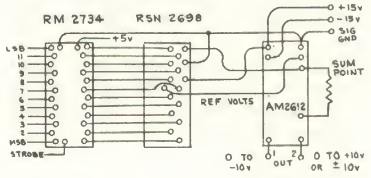
The D/A/D Modules can be used in many configurations to achieve high performance Digital-to-Analog conversion economically. The simplest System uses only the RSN unit with an economy operational amplifier.



With the use of an AM unit a variety of Output Ranges becomes available.



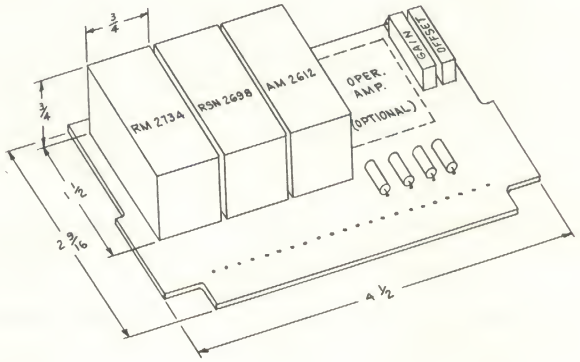
In some application the binary number is available only momentarily and a strobe system and jam transfer is required. The RM Module can sample digital data in 25 nanoseconds and hold it indefinitely for conversion.



PASTORIZA Electronics provides other modules for such operations as level shifting, up-down counting, extended voltage output ranges, and sample and hold. Modules for extended temperature range are also available.

D/A/D Mounting Card

This D/A/D mother board can contain a Register Module, Resistor, Switch Network Module, and a variety of Amplifier options. Gain and Offset adjust pots are also mounted on the printed card shown.



Digital-to-Analog Converter Cards

P.E.I. offers its customers standard D/A converter cards (DAC Series), and will also design and assemble D/A converters on customer cards for an initial layout charge, using D/A/D series modules. To order a complete D/A converter card, the customer need only provide the following specifications:

Number of Bits of Resolution (Up to 12)
Input Digital Storage Yes.....No.....
Input Code Binary.....BCD.....
Output Voltage Range "1"s....."0"s.....
Settling Time .....microseconds
Card Size, connector, outline card drawing.

Quality Control

All D/A/D units are completely tested. Data is available on RSN unit operation as a function of temperature. All units are warranted for trouble free operation for one year.

Custom Design

D/A/D Modules permit custom design with a minimum of extra cost. Quotations will be provided on special equipments including multiple units in one chassis. Engineering coordination is included in quotations to insure customer satisfaction.

Auxiliary Equipment For Systems Design

PASTORIZA Electronics, offers the services of their systems design capability for the fabrication of instruments and systems in custom design.

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PASTORIZA
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DIC 2760

DIGITAL-to-CURRENT CONVERTER

New approach to Digital/Analog conversion

Maximum Speed

Minimum size for packaging

Minimum price/performance ratio

Contains:

- **Reference Supply**
- **Resistor Network**
- **Up to 12 Switches**

Specifications:

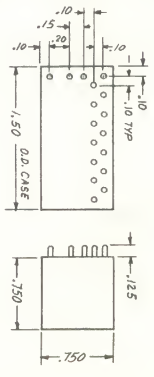
DIC-2760 is used in the design of D/A Converters; converting micrologic binary signal levels to weighted currents. These currents are summed and presented at a summing point output where they may be converted to voltage with any operational amplifier. (See Figure 1).

ELECTRICAL:

Inputs:	Resolution	Up to 12 bits
	Coding	Binary or BCD
	Signal Levels	"0" < .5V, "1" > 3V.
	Impedance	Compatible with TTL logic.
	Switching Speed	50 nanoseconds
	Sw. Transient Duration	50 nanoseconds
	Sw. Transient Amplitude	1%
	Temperature Coefficient	.002%/°C
	Power	–15 V @ 50 mas.
Output:	Range	0 to –3.8 ma. (Approx.) at virtual GND.
	Accuracy	±½ least bit

MECHANICAL:

Size 3/4" x 3/4" x 1½"
Weight 1 oz.



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DIGITAL-to-CURRENT CONVERTER

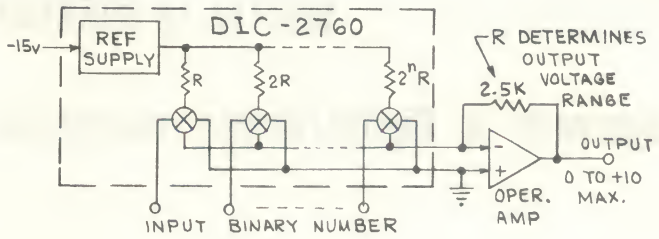

Figure 1

Figure 1 illustrates DIC-2760 used in a D/A converter. Speed, settling time, voltage and current output are dependent only on the operational amplifier and Resistor R.

Model DIC-2760 is inherently high speed because it's switching technique minimizes current and voltage changes in the resistor network, and low level switching reduces pickup from switch signals.

When used with high slew rate operational amplifiers, a D/A converter can be achieved with unparalleled performance. This configuration is used in scope deflection circuits.

With new low priced monolithic operational amplifiers an economy converter can be achieved for lower speed requirements using minimum space.

COMPATIBLE MODULES

P.E.I. offers other compatible modules in this D/A/D series:

RSN-2698	Medium Speed Digital to Current Converter
RM-2734	Storage Register containing up to 12-bits of Storage.
AM-2612	Amplifier Module containing one or two operational amplifiers for general purpose applications.
BD	P.C. board with sockets for mounting modules.

MODELS AVAILABLE

BINARY UNITS

DIC-2760-12B 12-bit switching, resistor network and reference
-10B 10-bit switching, resistor network and reference
- 9B 9-bit switching, resistor network and reference
- 8B 8-bit switching, resistor network and reference

BCD UNITS

DIC-2760-12BCD 12-bit switching, resistor network and reference
- 8BCD 8-bit switching, resistor network and reference

P.E.I. will also provide complete custom designed D/A Converters on customer cards.

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